We claim:

1. A method of encoding data onto an object, comprising:

    a) preparing a carrier medium containing quantum dots selected to give said carrier medium defined fluorescent emission characteristics encoding predetermined

5   information; and

    b) applying said carrier medium to said object.

2. A method as claimed in claim 1, wherein the concentration and type of said quantum dots are selected to give said carrier medium defined emission characteristics.

3. A method as claimed in claim 2, wherein said carrier medium comprises an ink

10 that is applied to said object in the form of a microscopic or macroscopic drop.

4. A method as claimed in claim 3, wherein a protective coating is applied over said microscopic or macroscopic drop.

5. A method as claimed in claim 3, wherein said ink further comprises a polymer or a mix of polymers and solvent(s).

15 6. A method as claimed in claim 1, wherein said ink further comprises additives to improve viscosity and adhesion properties.

7. A method as claimed in claim 1, wherein said quantum dots are made from semiconductor materials.

8. A method as claimed in claim 1, wherein said quantum dots are made from

20 materials in IVA and VIA of the periodic table.

9. A method as claimed in claim 1, wherein said quantum dots are selected from the group consisting of: cadmium selenide, cadmium sulfide, zinc selenide, and zinc sulfide.

10. A method as claimed in claim 3, wherein quantum dots with different emission wavelengths are distributed homogenously in said ink.

11. A method of decoding information encoded by the emission characteristics of quantum dots in a carrier medium, comprising:

5   exciting the quantum dots in said carrier medium to initiate fluorescence; and

           processing the resulting emission spectra to extract said decoded information.

12. A method as claimed in claim 11, wherein said emission spectra are processed to remove noise and ensure spectral line separation.

13. A method as claimed in claim 12, wherein said noise is removed with a digital

10 filter.

14. A method as claimed in claim 13, wherein said spectral lines are separated by a de-convolution operation.

15. A method as claimed in claim 14, wherein said de-convolution operation is represented by the equation:

15    $\Sigma_i \; k(\lambda i) \cdot \delta(\lambda - \lambda i) = IFT\{ \; FT[f(\lambda)] \; / \; FT[p(\lambda)] \; \}$,

where $\delta(\lambda)$ represent an impulse function, $k(\lambda i)$ is the intensity of a $\delta(\lambda)$ at λi, $p(\lambda)$ denotes the profile function of the spectrum of quantum dots.

16. A method as claimed in claim 14, wherein said information is extracted from the positions and intensities of spectral lines with reference to a predetermined code book.

20 17. An apparatus for decoding information encoded by the emission characteristics of quantum dots in a carrier medium, comprising:

       a light source for exciting said quantum dots to emit light;

a spectroscopic detector for detecting said emitted light; and

a processor for extracting said encoded information from the emission characteristics of said quantum dots.

18. An apparatus as claimed in claim 17, processor is responsive to the intensity and emission spectra of said quantum dots to extract said encoded information.

19. An apparatus as claimed in claim 18, wherein said processor includes a digital filter for removing noise.

20. An apparatus as claimed in claim 19, wherein said processor performs a de-convolution operation to enhance separation of spectral lines in said emission spectra.

21. An apparatus as claimed in claim 17, wherein said detector is coupled to said light source by a first optical fiber surrounded by a bundle of optical fibers connected to said light source.

22. An apparatus as claimed in claim 20, wherein said bundle of optical fibers terminates in an inverted funnel.

23. An apparatus as claimed in claim 17, wherein said processor is a computer connected to said spectrum sensor.